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PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

System for Providing Information to Intending Consumers

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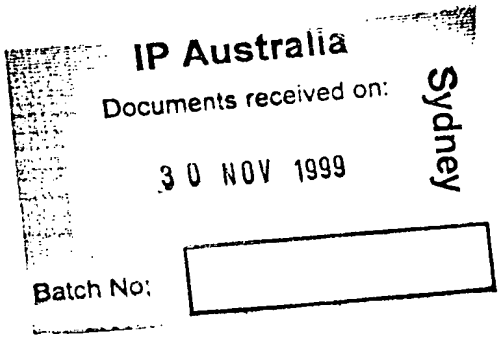
This invention is best described in the following statement:



SYSTEM FOR PROVIDING INFORMATION TO INTENDING CONSUMERS

Technical Field of the Invention

The present invention relates to a computerised system for providing information to intending consumers of various commodity products and/or services.

Background Art

Consumers of commodity products and/or services are often interested in obtaining specific, relevant information about their intending purchase. Such information frequently includes the availability and pricing of the desired product or service, preferably from several retailers so that comparisons can be made.

One known method in which an intending consumer can obtain the relevant information is through browsing various media for advertisements that have been placed by retailers. The various media can include newspapers, magazines or the Internet based World Wide Web (WWW). Advertisements can also appear in these media as classified listings.

Another method in which an intending consumer can obtain the relevant information is through accessing test reports and the like, which are published in magazines or other publications associated with consumer interest groups.

Another method in which an intending consumer can obtain the relevant information is through locating and directly contacting the particular retailer concerned. Firstly, the retailer must be known. Thereafter, the retailer can be located in several ways, including the use of a printed telephone directory or using a keyword-based search engine on the WWW.

The foregoing methods can be time consuming, especially if it is desired to perform comparisons between several retailers. This problem can be further compounded on the WWW, since a variety of data structures and formats are used to store and present the relevant data.

The foregoing methods can also be out of date, although hopefully not in the situation where direct contact has been made with the retailer.

It is an object of the present invention to provide a means for providing information to intending consumers of commodity products and/or services and to at least ameliorate one or more shortcomings of the prior art.

Disclosure of the Invention

In accordance with one aspect of the present invention, there is provided a product information distribution system comprising:

a database having records of user purchasable products, each said record including fields for at least identification and geographical availability of said product,

an input means for receiving input data from a user related to a preferred product which is selected from one of said product identification fields of said records, a distance value and a preferred geographical location from which said preferred product is to be sourced,

searching means for searching said database according to said input data and for determining a search result, said search result relating to those of said records including products meeting said product identification fields and available within a boundary determined by said distance value of said preferred geographical location, and

an output display means for displaying said search result to said user.

In accordance with another aspect of the present invention there is provided a computerised system comprising:

an input means for receiving input data including a user-selected market entity, a reference geographical location, and a maximum deviation from said reference geographical location,

an output means for displaying information to the user, and

a memory means including an executable user-interface program for operatively controlling said input means and said output means, a database of records including an identity and geographical availability for each of a plurality of market entities, and an executable searching program for searching said database for records that correlate with said input data and for enabling said records that correlate to be displayed as information on said output means.

In accordance with still another aspect of the present invention there is provided a method of facilitating Internet-assisted commerce, said method comprising the steps of:

collecting a plurality of retailer related records, each of said retailer related records including a product code, and a related geographical availability in longitudinal and latitudinal form,

storing said plurality of retailer related records in searchable form,

providing a means for selectively retrieving one or more particular retailer related records based upon a user entered product code and a maximum allowed deviation from said geographical availability.

In accordance with another aspect of the present invention there is provided a system for distributing information related to user purchasable products, said system comprising:

a database of records including fields related to identification, pricing, characterisation and geographical availability of a plurality of user purchasable products, said records also including fields related to a plurality of suppliers of the user purchasable products,

input means for receiving user input data related to at least a desired characterisation and geographical availability of a desired user purchasable product,

searching means for searching said database on the basis of said user input data and for determining a search result, said search result having records including said fields related to identification, pricing and supplier, and

an output display means for displaying said search result.

In accordance with another aspect of the present invention there is provided a computerised method of distributing product information, said method comprising the steps of:

tendering a plurality of product for selection of one desired product type by the user,

tendering at least one or more relevant characterising product attributes, on the basis of the selected product type, for selection of one or more attribute preferences by the user,

obtaining geographical data related to an acceptable geographical purchasing area by the user, and

returning any of a plurality of pre-stored data records which correlate to all of said selections and said acceptable geographical purchasing area.

In accordance with another aspect of the present invention, there is provided a method of dynamically constructing a searchable index of valid identifiers, said method comprising the steps of:

(i) prompting a user for an initial word;

(ii) building a set of possible valid identifiers based on said initial word and previously mapped relationships with respect to said initial word;

(iii) displaying said set for selection by the user,

(iv) adding the initial word to a list of unmatched words, prompting the user for a new initial word and repeating from step (ii), if a selection from said set has not been made by the user;

(v) providing a further mapped relationship for each of said list of unmatched words with a selected valid identifier, if a selection from said set is made by the user.

In accordance with another aspect of the present invention, there is provided an indexing system comprising:

means for obtaining an initial word of interest;

a database for storing words and any related alternative words, each of said stored words being searchable on the basis of a mapped relationship with the initial word of interest; and

means for mapping and storing newly related words to said database where a search of the database cannot be determine a mapped relationship with the initial word of interest.

Several advantages arise from the ability of the preferred embodiment to perform a search based on the matching between the intending consumer's selection of pre-defined attributes (rather than key-words) of the desired product or service ("market entity"), and those records on a dedicated database that are stored in a format that is common for all participants who are usually a retailer or supplier/manufacturer. These advantages include:

(a) The intending consumer's ability to specify a specific product and/or service, and if necessary refine the search criteria based on preferred attributes, is enhanced over prior art key-word matching, and

(b) The intending consumer's ability to perform comparisons of price, value, availability, and other parameters of various commodity products and/or services, is enhanced over prior art key word matching, the results of which tend to make such a task difficult and/or time consuming.

Several advantages arise from the ability of the preferred embodiment to perform a search based upon retail outlets located within a specified geographical area:

(a) Products and services can be advertised on-line that had previously not been available on-line, since existing on-line shopping is usually restricted to products that are able to be delivered by mail, courier and the like. The products not suitable for delivery include for example, low value items, bulky items, or heavy items. Without this restriction, goods which, because of their nature dictate that the customer receive the goods in person, can also be offered. This could include goods such as petrol, groceries, hot food, clothing etc. This could also include services, such as automatic teller machines where it is desired for the consumer to know where the service outlet is located.

(b) The retailer of goods which are "ordinarily" purchased (as distinct to "on-line" purchased) can provide additional, computerised information and support for their customers which they previously may not have been able to offer.

The present invention has particular application for Internet-assisted shopping by consumers who intend to purchase and/or take delivery of the desired commodity product or service from a physical retail outlet.

Brief Description of the Drawings

A preferred embodiment of the present invention will now be described with reference to the drawings, in which:

Fig. 1 is a system block diagram of the main components required to implement the preferred embodiment,

Fig. 2 is a flow chart explaining the operation of the method of the preferred embodiment,

Fig. 3 is a diagram of data types used in a database of the preferred embodiment, and

Fig. 4 is a flow chart explaining the operation of an alternative method for obtaining the desired product selection from the user, being a series of alternative substeps of the preferred embodiment and referred to herein as "Smart Indexing System".

Detailed Description including Best Mode

Referring to Fig. 1, a system 20 for providing information to intending consumers includes a collection of consumer-owned equipment 1 connected by a

telephone line 21 to a computer network 10, which is in turn connected by a network cable 22 to a host computer 60 owned by a central administrator.

In the context of this description, the ambit of "information to intending consumers" includes the provision of information both to assist intending consumers with their purchasing decisions, and in the form of advertisements.

The consumer-owned equipment 1 includes a desktop personal computer (PC) 9, typically connected to each of a printer 11, a monitor 14, a keyboard 15 and a modem 5 to provide access to the computer network 10 which in this case is the Internet. The PC 9 is loaded with software programs including a WWW browser 2, a browser controller 3 and network or Internet connection software 4.

The host computer 60 which is connected to the Internet 10 includes a web server 61 for communication with each of the consumer owned equipment 1 via Hypertext Transfer Protocol (HTTP), and the applications server 63 via Common Gateway Interface (CGI) protocol.

The applications server 63 includes a user-interface memory area 19, a user interface program 12, a searching program 7, a database 8, a executable database retrieval program 8a (e.g., "Access" or "Oracle"), a specialised spatial searching application 13a (eg "Map Info"), a geographical data conversion program 13 (eg "GeoLoc"), an administration-interface memory area 25 and an administration interface program 26.

Fig. 2 shows a method 30 for providing information related to various goods and services, using the system 20 described in relation to Fig. 1 and commences with a start step 30 at which the user interface program 12 on the applications server 63 is executed.

In step 31, the initial product type is selected by the intending consumer and entered into the PC 1. In one embodiment, step 31 includes the following sub-steps.

In sub-step 31a, the intending consumer is prompted by the PC 1 using a menu displayed on an output means, which in this case is the monitor 14, to make a selection from an initial "Product Type Pick List".

In sub-step 31b, the intending consumer enters data corresponding to a selected product type into the input means of the PC 1, which in this case is the keyboard 15.

For the purpose of illustration in this description, an example of an initial product type could be "liquor", taken from an initial "Product Type Pick List" having for example, "liquor", "services", "petrol", "motor vehicles" and "fast food".

In sub-step 31c, the intending consumer is prompted to select a product sub-type from another "Product Pick List", which is generated (to be described later) by the system and is based on the earlier selected product type.

For the purpose of illustration in this description, an example of a product sub-type could be "beer", taken from a "Liquor Pick List" having for example, "beer", "wine" and "spirits".

The process of refining the required product type continues for as many levels of product types as are determined by the central administrator. For example there may not be any further sub-types for the "beer" product type, but the "spirits" product type may lead to a "Spirit Pick List" having for example, "gin", "scotch whisky" and "vodka".

In sub-step 31d, the selection of the required product type from the intended consumer is completed.

In step 32, the intending consumer is prompted to make one or more selections from a set of "Product Attribute Pick Lists", which are generated (to be later described) by the system. Some of the available product attributes are common to a number of related product types and are therefore considered to be "Generic Attributes" to those particular product types. Other product attributes are only common to a specific product type. Required values for one or more of these attributes can be selected for use as search criteria. One or more of these attributes can also be selected for display in the results of a subsequent search.

For example, one generic attribute associated with the product type of liquor could be "packaging" which provides preference options such as cans, large bottles, small bottles ("stubbies") and the like. Another attribute associated with the product type of beer could be "alcohol content" which provides preference options such as high alcohol content or low alcohol content. Yet still another attribute could be "manufacturer" which provides preference options such as various of the different manufacturers of beer.

For each product, some of the available attributes are classified as "key" attributes, and others are classified as "non-key" attributes. Although "key" attributes

are those that are required to uniquely identify a particular product, the user can select any combination of "key" and "non-key" attributes. No attributes are essential to be specified by the user for the system 20 to operate, but a query with no specified attributes would return a full list of products of a particular type.

In step 33, the search criteria is completed and is entered as such by the intending consumer on the keyboard 15. This search criteria information is then stored in the user interface memory area 19.

In step 34, the intending consumer is prompted by the PC 1 to enter a current, or reference physical address, for example, "*5 Smith Street, Smithville*". The intending consumer is then also prompted to enter a radius corresponding to a maximum distance that they would be prepared to physically travel in order to purchase the commodity product of interest.

In step 35, the search program 7 on the applications server 63 is executed.

The search program 7 calls the geographical data conversion program 13 which converts the physical address data entered at step 34 relating to the consumer's geographical location to latitude and longitude. The geographical data conversion program 13, for this example, is a commercially available program entitled *"GeoLoc"* which is supplied by MapInfo Australia Pty Limited.

The search program 7 then calls the database retrieval program 8a of the database 8 is carried out by a searching application for example Access (™) or Oracle (™), to determine a list of records various types (to be later described) that fulfil the intending consumer's search criteria. The search program 7 also calls the specialised spatial searching application 13a, such as MapInfo (™).

The search program 7 returns a dynamic document having records from the database 8 that match all of the search criteria, including the physical address data, back to the web server 61.

In step 36, the search program 7 causes a display on the monitor 14 of the PC 1 in two sections; as follows:

(i) Search Summary: This is a summary of the product related inputs specified by the user and is constructed by concatenating the values (ie specific preferences) of each product attribute that were specified in the search criteria, and

(ii) Results List: This is a list of database records constructed by concatenating the values of the product attributes that were not specified in the search criteria. Hence, if no attributes were specified, then a full list of database records of products of the selected type would be returned in the Results List. The more detailed the Search Summary, the less detail provided in the Results List, and the less number of products in the Results List. The Results Lists can identify a unique product or a class of products. The fields displayed in the results list may also be specified by the user.

The ranking of each of the database records in the Results List can be controlled by the user selecting an attribute and then specifying ascending or descending order.

In step 37, the system 20 logs the result of the executed search program 7. Although step 37 is not directly related to providing information to assist intending consumers with their purchasing decisions, it is relevant to the overall operation of the system 20, since it provides the information necessary for generating revenue for the system administrator by selling advertising space on the system 20.

In step 38, the intending consumer is prompted as to whether they desire to refine the Search Summary and therefore, refine the Results Lists. If "yes" is entered into the PC 1, then step 35 is returned to. However, if "no" is entered into the PC 1, then step 39 is proceeded to. This feature of step 38 allows the intending consumer to interactively adjust the search criteria in order to identify the desired product or class of products.

In step 39, the intending consumer is provided with an option to print out the final result on the printer 11 and the method is then completed at step 40.

The execution of the user interface program 12 as described includes not only the preceding method steps but also the presentation of advertisements to the intending consumer at appropriate points.

The advertising can take the form of banner advertising, the display of which can be dependent on the type of product/service in the search request, or can be dependent on the values specified in the input search summary.

Similarly, the advertising can take the form of appropriate hyperlinks to other websites, such as those belonging to a particular retailer or supplier/manufacturer or to

additional information on a particular product in the form of video clips or other multi-media attributes.

The system 20 is provided and maintained by the central administrator who has made contact with a selection of retailers or supplier/manufacturers with a participation proposal. Such a proposal can include either participation by advertising of their products/services on the system 20, or participation by having their products/services listed on the database 8.

A retailer or supplier/manufacturer can also be persuaded to advertise on the system 20 by virtue of its usefulness to intending consumers, which in turn leads to potential exposure to advertisements whilst the intending consumer is using the system 20.

The advertisements are stored in the user interface memory area 19 of the applications server 63 are retrieved with the execution of the user interface program 12 where appropriate, in return for payment from the retailer or supplier/manufacturer.

Referring now to Fig. 3, the database 8 on the applications server 63 includes a compilation of records, as follows:

(I) A table of records of the **Supplier** data type 70, each record of this type having fields for at least:

  (a) a unique supplier identifier code (ID) for a particular one of a group of suppliers/manufacturers that have a product or products selected for inclusion in the database 8 by the central administrator; and

  (b) a supplier's name corresponding to the unique supplier identifier code mentioned above in (a).

(II) A table of records of the **Product** data type 71, each record of this type having fields for at least:

  (a) a unique product identifier code (ID) for a particular commodity product that has been selected for inclusion in the database 8 by the central administrator;

  (b) a barcode number, which can be used if the particular commodity product mentioned above in (a) has a barcode number;

  (c) a product name, which may not be unique

(d) a brief product description, which may be used to differentiate products with the same name but which may, for example, be packaged differently

(e) a pointer to a record of the data type **Supplier;** and

(f) a pointer to a record of the data type **Product Type.**

(III) A table of records of the **Product Type** data type 72, each record of this type having fields for at least:

(a) a unique product type identifier code (ID) for a particular set of similar products that have been selected for inclusion on the database 8 by the central administrator;

(b) a descriptive name for the product type; and

(c) the name of a table within the database 8 used to store the attribute information related to products that can be classified within the product type related to this particular record.

(d) a pointer to a record of the data type **Product Type.**

(IV) A table of records of the **Product Definition** data type 74, each record of this type having fields for at least:

(a) a pointer to a record of the data type **Product Type** that identifies the product type that an attribute description in this record relates to;

(b) the field name that this record relates to;

(c) a caption to be used when constructing forms that include the field that this record relates to;

(d) a control type to be used when constructing forms that include the field that this record relates to; and

(e) a control source to be used when constructing forms that include the field that this record relates to.

(V) A table of records of the **Retailer** data type 75, each record of this type having fields for at least:

(a) a unique location identifier code (ID) for a particular retail store that has entered into a participation agreement with the central administrator of the system 20;

(b) a flag to indicate if the retailer is a physical or an on-line retailer;

(c)-(d) the geographical location (if applicable) of the retail store in a latitude and longitude format;

(e)-(l) other details related to the particular retail store, for example street address, website URL, hours of opening, payment methods, and the like;

(m) a pointer to a record of the type **Retail Group** that is used to determine the price scale;

(VI) A table of records of the **Retail Group** data type 76, each record of this type having fields for at least:

(a) a unique retail group identifier code (ID) for a group of retailers that have entered into a participation agreement with the central administrator of the system 20; and

(b) retail group name.

(VII) A table of records of the **Price** data type 77, each record of this data type having fields for at least:

(a) a pointer to a record of the data type **Retail Group;**

(b) a pointer to a record of the data type **Product;**

(c) a start date field;

(d) a finish date field;

(e) a unit price field;

(f) a normalised price field;

(g) a normalised quantity field;

(h) an "on-special" flag field; and

(i) a time stamp field.

(VIII) A table of records of the **Stock** data type 78, each record of this data type having fields for at least:

(a) a pointer to a record of the type **Location;**

(b) a pointer to a record of the type **Product;**

(c) an "in stock" flag denoting availability of the particular product;

(d) a stock level code denoting availability of the particular product;

(e) a field containing the date the last update was generated; and

(f) a time stamp field.

Further data structures are provided, which are specific to each of the types chosen by the system administrator to be available.

For each product type, a table of records of a data type specific to the product type is provided. Each record of this "custom" data type is related to a uniquely identified product.

The foregoing records and their relationships to one another take into account modern commercial arrangements for the sale of some products or services. For instance, a particular **Product** that is manufactured or imported by a specific **Supplier** may be available through a chain of **Retailers** belonging to a **Retail Group**.

The foregoing records and their relationships also supports the capability of the system to provide comprehensive results, in terms of availability of a particular product, since the user is not required to know the actual stockists of the required product as would be the case for instance if a telephone directory were being used to obtain the required information.

The use of the product definitions contained within the database to dynamically construct the user interface when the user interface program 12 is executed will now be described.

The system queries the records in the database 8 to obtain a current list of top level product types. The results are used to populate the available options in the initial "Product Pick List" that is presented to the user in step 31.

After the user has selected an option from the initial "Product Pick List" in step 32, the system uses the selected option to query the records in the database 8 to obtain a current list of valid product sub-types related to the selected initial product type. The results are used to populate the available options in a second "Product Pick List" that is presented to the user in step 33. The process of refining the required product type continues for as many levels of product types as have been determined by the system operator.

Each time the user selects an option from a "Product Pick List" the system uses the selected option to determine attribute fields (if any) that are associated with products of the specified product type. This information is then used to retrieve the corresponding field definitions from the corresponding **Product Definition** records.

The field definitions for the set of attributes accumulated from each level of product type are used to construct the user interface presented in step 30 to 36. This

mechanism enables the system to dynamically generate the appropriate interface for the product criteria selected.

The maintenance and updating of the database 8 will now be described. Each retailer that wishes to participate is required to provide, for example, pricing and stock details for each listed product. Each listed product must match with a listed record of the type **Product** 70, which includes the unique product identifier code, the product barcode (if allocated), a **Supplier** code, and a corresponding **Product Type**. The product type identifies the corresponding records in the **Product Definition** and identify the table containing the relevant product attributes, for example **Liquor Products**. Retailers who have records on the database 8 can supply updated information for their pricing and stock levels, based on either the unique product identifier or barcode identification.

The information on pricing and stock can be provided from the retailer to the central administrator in several ways. One way is in paper form, where the retailer fills in a pro-forma document provided by the central administrator. Alternatively, where computerised facilities are available the retailer can transfer the information electronically. The central administrator can then perform the required data entry into the database 8 with the aid of computerised input. For retailers having such computerised facilities, they will have their own database containing product/price information, together with utilities for querying the database and for exporting the necessary data.

The exporting of the necessary data and submission of the updated price list or stock levels can be implemented using an Internet protocol based mechanism, although a browser based system can also be used. The retailer can request the appropriate submission form by specifying a corresponding URL (Uniform Resource Location). The associated submission form then prompts the retailer for the full path for the updated price list and the file is then submitted. Optionally, the system 20 can include mechanisms such as cookies for storing the file path. Also, a dedicated client (non-browser) can be provided for submitting price lists or stock levels.

The data for exporting **Price** information can be arranged as follows:

- A **file header** including retailer identification, date of creation and default settings for start and finish date if required. The start date can be specified, although a default value is applied if necessary. The finish date only

needs to be specified if a definite final date is known, which could be relevant for "specials".

- **Pricing records** for each product, including mandatory fields related to (for instance) product identification and price, and optional fields related to (for instance) products being "on special". The optional fields will vary from product to product.

After the retailer has submitted an updated price list as described above, the system 20 adds the new price listing to the database 8. The information contained in the updated price list is added to a temporary table in the database 8. The system uses some information from the file header to complete the fields for the database. The system also includes a date and time stamp with each record as it is added to the database. In the event of a problem with differentiating between two records the time stamp will be used to identify the most recent record.

After a new record is added to the database 8, the system 20 modifies any pre-existing records for the same retailer/product combination. These modifications can involve:

1. splitting pre-existing records that start before and finish after the new record,
2. resetting the finish date for any pre-existing records that start before the new record, and
3. resetting the start date for any pre-existing records that finish after the new record.

It should be noted that these modifications do not occur on records with finish dates that have been set prior to a new start date, or records with start dates already set to dates after the new finish date.

The new records for updated price information are copied from the temporary table and appended to the price table in the database. Records within the database are not modified in order to update prices, rather, existing records are always superseded by new records.

Finally, the system 20 removes obsolete records from the database 8. Such obsolete records are those which have finish dates that have expired, or have finish dates that are prior to this start date (logically superseded). The system 20 checks that at least one valid retailer/price entry remains and will raise a warning if no valid entries

are present after this last step. Obviously, as products are discontinued these warnings will be generated but will not indicate an actual problem.

The data for exporting **Stock** information can be arranged as follows:

- A **file header** including retailer identification and date of creation.
- **Stock records** for each product, including fields related to product identification and a keyword to indicate the action to be taken. The keywords for stock operations are 'Add', 'Update', and 'Delete'. Other fields are optional and may vary from product to product, including fields indicating products being "in stock" or "out of stock" or current stock levels. The date updated must be specified if either of these fields is supplied.

After the retailer has submitted an updated stock listing as described above, the system 20 adds the new stock listing to the database 8. The updated stock information is used to modify existing records in the stock table in the database. New records are only appended if required to indicate a new product being stocked by a retailer. Old records are deleted if required. Most housekeeping is taken care of by the update process. The exception is housekeeping related to changes in the products database, such as when a particular product is discontinued.

The foregoing computerised updating has the advantage in that the database 8 can be made "live", so as to provide constantly updated information, which is of particular use in relation to stock levels and items that are "on special".

Although it will generally not be necessary for retailers to export all price information for every update, if dynamic monitoring of stock levels is provided, it will be only necessary to supply a price update for a single product. Although such "incremental" updates can be implemented, a "full" update can also be completed on a regular basis.

A number of enhancements to the preferred embodiment described above, will now be described.

Price Normalisation: The result returned by the search program 7 can include the calculation of a normalised price. The normalised price is determined by dividing the item price by the net quantity. This provides a method for comparing the same, or similar products, that are packaged in different size units.

Distance Factor: The results returned by the search program 7 can include the calculation of an adjusted price based on the distance of the retail outlet from the

specified origin of the search. The adjusted price may be determined using a distance factor, specified as cost per unit distance, that is supplied by the user. This provides a method for discriminating between retail outlets that are different distances from the search origin.

Cost Adjustment: The results returned by the search program 7 can include the calculation of an adjusted price based on other associated costs or savings. The adjusted price can include allowances for additional costs such as delivery or taxes, and can be adjusted to allow for savings associated with staff or shareholder discounts or other loyalty or benefit programs. This provides a method for discriminating between different retail outlets and also facilitates comparison between on-line and off-line purchases.

Currency Conversion: The results returned by the search program 7 can include the calculation of an adjusted price based on conversion of currencies. This provides a method for discriminating between retail outlets in different countries and further facilitates comparison between on-line purchases and off-line purchases. This feature requires that currency exchange information also be maintained.

Identification of Specials: The association of product and price for a particular retailer may also include support for an additional attribute that can be used to indicate when the particular item is "on special". The identification of a product as "on special" can be subject to verification before being displayed to the user, with clearly defined rules regarding specials that minimise misuse of the attribute. For example, a rule may require that the "special" price be at least a certain percentage, say 10%, less than the last used "standard" price from the same retailer. Alternative methods of calculating a "standard" price may include averaging of all prices from all retailers. A product would then be "on special" if it is 10% cheaper than the average price. These rules may be also be used to indicate any price that was a certain amount below average. In other words, the system would identify "good buys" even if the relevant retailer did not identify the item as being "on special".

Shopping Lists: An extension to the system (20) involves the preparation of a price comparison for a combination of products, rather than a single item. The user supplies a shopping list and the system then calculates a total price for purchasing the specified items from a number of retail outlets. This process may involve further interaction with the user in order to identify unique products for each item on the list.

Whilst some items on the list may be more expensive, the user may select the retail outlet with the cheapest total price.

E-mail Notification: The system (20) can also be enhanced to support e-mail notification of changes in product status within the database 8 to consumers. Examples of situations where can notification may be used include notification when a particular product:

- goes on special;
- drops below a specified price;
- becomes available after being released; and
- becomes available after being out of stock

Users would register the product(s) they were interested in by specifying their e-mail address and the product identifier. As the system is updated the register is checked and e-mails sent to the various users. A variation to this scheme may involve registration of a "query" that if satisfied then generates an e-mail notification. Examples where this may be of use include notification of the release of a new book by a particular author or an audio CD by a particular artist.

Stock Levels: The association of product and price for a particular retailer may also include support for an additional attribute to indicate stock levels at particular stores. This assists consumers in identifying which retail outlet to visit. Such analysis may also be used to indicate when stock that is not currently available, is expected to become available.

Analysis: An extension to the system (20) involves the calculation of prices that involve more sophisticated calculations based on a set of specified parameters. Examples of price comparisons involving more sophisticated analysis include:

- mobile phone plans;
- long distance phone calls carriers;
- mortgage costs; and
- insurance policies

These types of price comparison typically involve evaluation of specific financial models.

Product Information: Product specific information that is additional to the attributes maintained in the database 8 can be stored, for example, video clips from advertisements, reviews of books or CD's, tasting notes for wines. Optionally, a

separate search mechanism can be provided to search through this additional information.

Coupons: The effectiveness of the system 20 in converting "queries" into "sales" can be monitored using coupons. Coupons can be used to monitor the impact of the system. Users would print out a "coupon" when they had finished their query. It may contain some details on the query performed. Presentation of the coupon at the time of purchase can then provide a discount on the final purchase price thus enticing users to further use the system 20.

Delivery Service: In order to provide a complete on-line service to consumers it may be appropriate to provide a delivery service that works closely with the system. The delivery service can operate in specific areas and collect orders from regular retail outlets and deliver them to the household. The delivery service may be operated on a franchise basis. This may be combined with an on-line payment system and would effectively make current retailers the "distribution warehouse" for what would become an essentially on-line system.

Smart Indexing System: The initial product type can be selected by the user with the aid of a smart indexing system, instead of step 31 as earlier discussed. Such a system incorporates a method of dynamically constructing an index that maps one word to a list of alternative words. Construction of the index is facilitated by a database that contains searchable words and their alternatives and includes a procedure for adding words to the database.

Firstly, to assist with understanding the smart indexing system, the following serves as a background explanation.

Business directories use a classification system to assist users locate the business service they require. This approach is used by most hardcopy business directories and on-line business directories. In order to locate a business the consumer must know the name of the category the business is listed under. However, there can be a number of possible problems that consumers will experience in determining the correct category, particularly when using an on-line directory.

The most common problems with both hard copy and on-line directories is that the most appropriate category for a particular business is not always obvious. For example, a legal practise may be classified under "Attorneys", "Lawyers", "Legal Services", or "Solicitors" depending on the classification system.

Some directories provide an index to assist consumers to identify the most appropriate category based on a set of synonyms. Other directories, particularly on-line systems, use a hierarchy of categories through which the consumer can browse to locate the required category.

The interactive nature of on-line directories makes it possible for them to support keyword searching. This may cause problems when a keyword can relate to multiple categories. For example, the keyword "coffee" may locate categories of "Coffee beans", "Coffee machines", and "Coffee mugs". Some systems would present all three categories and request a selection from the consumer. Other systems would stop at the first category that matches. The keyword matching systems are also generally intolerant of spelling errors. For example, the keyword "Optomitrist" would not locate the category for "Optometrists".

In summary, there are three types of problems that consumers may have when determining a category using existing business directories: problems associated with synonyms, problems caused by ambiguous keywords and problems caused by spelling errors. Although some systems handle some of these problems, no system appears to handle all three in a consistent manner. Furthermore, the underlying data structures are generally relatively static and require external intervention for new connections between words to be added.

The smart indexing system seeks to overcome or at least ameliorate one or more of the foregoing drawbacks.

The smart indexing system includes a database and a means for manipulating the information in the database. In one embodiment, the smart indexing system supports a set of 'valid' identifiers, and a set of 'alternate' identifiers that are mapped to the 'valid' identifiers. In the case of a business directory, the valid identifiers would be the actual categories used by the directory and the alternative identifiers would be the 'synonyms' for these categories. However, the term 'synonym' in this context means not only identifiers with similar meanings, but those identifiers which are associated to the valid identifier in any manner.

The system can handle identifiers which are spelling mistakes in the same way it handles identifiers which are words of a similar meaning.

The system supports a many-to-many relationship between alternate and valid identifiers: one alternate identifier can map to multiple valid identifiers and each valid identifier can have multiple alternate identifiers.

An embodiment of the indexing system will now be described with reference to Fig. 4 which commences with a start step 310a.

In step 310b, the user is prompted to enter an initial word.

In step 310c, the initial word that had been entered by the user is used to search a list of valid identifiers that correspond with a valid category.

Step 310d determines whether the user's initial word can provide a valid identifier or whether the search should continue.

In step 310e which is proceeded to in the case of the latter, the initial word that had been entered by the user is used to search a list of alternate identifiers, each of which have been previously mapped as such, with one or more valid identifers.

Step 310f determines whether the user's initial word can provide a valid identifier or whether the search should continue.

If the outcome of step 310f is that a valid identifer has been provided, then step 310h is proceeded to, wherein the system maps each of the unmatched (if any) initial words to the eventual selected valid identifier. This mapping can then be used for future searching.

If the outcome of step 310f is that a valid identifer has not been provided, then step 310g is proceeded to, wherein the user is requested to enter a new initail word. This cycle repeats until a valid identifier is selected.

In an alternative embodiment, the following pseudocode describes the selection of a valid identifier from a given initial word:

```
User specifies initial word
System retrieves list of valid identifiers which have initial word as an alternate
If list contains at least one entry then
        User requested to select/confirm required valid identifier
Else
        While valid identifier is not found
                System builds set of possible valid identifiers based on initial word
                System adds set of possible valid identifiers to database
                If set contains at least one entry
                        User requested to select/confirm required valid identifier
```

```
                Else
                        Current initial word added to a list of unmatched words
                        User requested to enter a new initial word
                End If
        Wend
        If list of unmatched words is not empty then
                All unmatched words are mapped to selected valid identifier and added to database
        End If
End If
System returns selected valid identifier
```

An advantage of the smart indexing sytem is that the mapping from alternate identifiers to valid identifiers occurs dynamically in response to the user's specified word.

There are two distinct mechanisms involved in generating new mappings:

1) System builds mapping based on the set of valid identifiers and some specific production rules

2) System generates a mapping based on the list of unmatched words and the final valid identifier

There are a number of production rules that can be used to build a list of possible valid identifiers from a given word. The simplest of these is to use string matching to find valid identifiers that contain the supplied word as a substring. For example, in a business directory system the word "Beer" may return a set of possible valid identifiers corresponding to the categories "Beer brewing equipment", "Packaged beer", and "Wholesale beer supplies". All of the resulting valid identifiers would be added to the database and would therefore be available to the next person who submits the same initial word. More sophisticated production rules could include using knowledge of category hierarchies to retrieve not only a valid identifier but the set of valid identifiers corresponding to the related sub-categories as well. For example, the initial word "Liquor" may return "Beer", "Wine" and "Spirits" in addition to the actual category of "Liquor". This enables the user to refine their search as part of the process of selecting the required category. Even more sophisticated production rules could involve the use of an external thesaurus or spelling checker to assist with identifying relevant valid identifiers.

The mechanism for mapping unmatched words to the valid identifier that is eventually selected is intended to act as a user oriented synonym generator and spell checker. It assumes that the unmatched words are somehow related to the eventual selection and that the user is able to come up with alternatives when their previous attempts at specifying a valid identifier have been unsuccessful. An example of this approach would be a user that accidentally typed "Optomitrist" instead of "Optometrist", when the system fails to find a match the user may realise their mistake and correct it. The system would then add "Optomitrist" as an alternative for "Optometrist" in the database, so that the next user that makes the same mistake would automatically be presented with the correct identifier as an option. Similarly, a user who was unsuccessful with "Glazier" may try "Window" and have more success.

Refinements to the smart indexing system will now be discussed. The basic system assumes that the list of valid identifiers are from a single set, such as the set of category names in a business directory. The system can be extended to support sets of keywords from multiple sources or contexts. For example, many business directories allow users to search for a category or a business name. In the revised form of the SIM these two sets of valid identifiers (the set of categories and the set of business names) can be combined, with an additional type flag to indicate the context to which an identifier belongs. The production rules used to build a list of potential identifiers for a given word can be different for each context. For example, the build from the category context can make use of the category hierarchy, but the build from the business name context would only use string matching. There is no theoretical limit on the number of contexts of identifiers that can be combined.

Another refinement that can be made to the system is the inclusion of counters in the database. Each time an alternate-valid identifier combination was used the use count for that combination would be incremented. When the list of possible identifiers was built the counters would be initialised to zero. As the different combinations were selected the use counts would increase. The inclusion of counters allows the combinations to be weighted, so that the list of possible identifiers presented to the user can be ordered.

Another refinement that can be made to the user interface is the ability for a user to select 'advanced options' as part of their search. These advanced options may include the ability for the user to specify the context in which the supplied word is to be

considered. This may be used to improve the response time of a search or to reduce the number of alternatives that are presented.

Other advanced search options can include the ability to use the supplied keyword to search in other contexts that are not included in the set of contexts automatically handled by the mechanism. For example, in a business directory situation a user may specify that the system undertake a full database search using the keyword rather than restricting the search to the category or business name contexts, even though such a search may take a significant amount of time.

The smart indexing system actively generates new mappings in response to the keywords submitted by the users. In some situations the mechanism may generate inappropriate synonyms for some of the valid identifiers. Maintenance of the system could therefore involve the periodic review of the database and removal of any serious discrepancies. As part of the review process it may also be appropriate to check for deliberate manipulation of the system, such as the introduction of inappropriate alternatives or manipulation of counts for commercial advantage.

In summary, features and/or advantages of the novel indexing system include the following:

- Dynamic generation of mapping between user submitted words and potential valid identifiers,

- Handling of a variety of relationships between words, including synonyms and spelling variations.

- Effective mechanism for resolving ambiguous user submitted words by presentation of list of likely alternatives for valid identifiers.

- Capability for refining a query as part of the confirmation process.

- Ability to generate lists of valid identifiers from a variety of contexts and to handle them in a consistent manner without requiring the user to specify the context of their search.

- Ability to incorporate different production rules for each context.

- Ability to incorporate use counters to assist with ranking of likely valid identifiers.

The foregoing describes only a number of embodiments of the present invention, and modifications can be made thereto without departing from the scope of the present invention. For example, the system could be implemented using software running on a server on a wide area network or a local area network, or on software supplied for instance on compact disc, running on a personal computer. Also, access to the system by the consumer could be had with the help of a third party operating, for instance, a central call centre.

Although the method is primarily intended to provide price comparisons for products that the consumer will subsequently purchase from physical retail outlets, it can also include prices for products that can be purchased from virtual retail outlets. In this way, most of the features of existing methods can be provided, plus additional features that relate to the location of products that meet geographical criteria.

Further, whilst the foregoing description is focused upon products such as retail goods for domestic consumption, other goods such as those for commercial consumption may be handled. Further, the products need not be specific goods, but for example services to be provided to the user. Such services may include legal, medical and dental services, and many others.

A number of aspects of the present invention, which are intended to identify, but not necessary limit, the scope of the present disclosure, are summarised in the following paragraphs:

~~Claims:~~ The Claims defining the invention are as follows:

1. A product information distribution system comprising:

a database having records of user purchasable products, each said record including fields for at least identification and geographical availability of said product,

an input means for receiving input data from a user related to a preferred product which is selected from one of said product identification fields of said records, a distance value and a preferred geographical location from which said preferred product is to be sourced,

searching means for searching said database according to said input data and for determining a search result, said search result relating to those of said records including products meeting said product identification fields and available within a boundary determined by said distance value of said preferred geographical location, and

an output display means for displaying said search result to said user.

2. A product information distribution system as recited in paragraph 1, wherein said preferred geographical location is a co-ordinate value and said boundary is determined by a radius thereabouts corresponding with said distance value.

3. A product information distribution system as recited in paragraph 1, wherein said geographical location is in longitudinal and latitudinal form.

4. A product information distribution system as recited in paragraph 1, wherein each said record of user purchasable products further includes at least one product attribute field and said input data is further related to said product attribute field.

5. A product information distribution system as recited in paragraph 4, wherein said search result can be sorted by the user on the basis of said product attribute field.

6. A product information distribution system as recited in any one of the preceding paragraphs, wherein each said record of user purchasable products further includes a pricing field and said input data is further related to said pricing field.

7. A product information distribution system as recited in paragraph 6, wherein said search result can be sorted by the user on the basis of said pricing field.

8. A product information distribution system as claimed in any one of the preceding claims, wherein said database and said searching means is accessible over the Internet by a user of said input means.

9. A product information distribution system as recited in any one of the preceding paragraphs, wherein said search result can be sorted by the user on the basis of said distance value.

10. A computerised system comprising:

an input means for receiving input data including a user-selected market entity, a reference geographical location, and a maximum deviation from said reference geographical location,

an output means for displaying information to the user, and

a memory means including an executable user-interface program for operatively controlling said input means and said output means, a database of records including an identity and geographical availability for each of a plurality of market entities, and an executable searching program for searching said database for records that correlate with said input data and for enabling said records that correlate to be displayed as information on said output means.

11. A system as recited in paragraph 10, wherein said database of records further includes current pricing information for each of said plurality of market entities, said current pricing information being outputted from a temporal test program being executed prior to an execution of said searching program.

12. A system as recited in paragraph 11, wherein said database of records further includes temporally independent pricing information for each of said plurality of market entities, said temporally independent pricing information being inputted to said temporal test program and being transparent to said searching program.

13. A system as recited in paragraph 12, wherein said temporally independent pricing information is accessible by said suppliers of said of the user purchasable products.

14. A method of facilitating Internet-assisted commerce, said method comprising the steps of:

collecting a plurality of retailer related records, each of said retailer related records including a product code, and a related geographical availability in longitudinal and latitudinal form,

storing said plurality of retailer related records in searchable form,

providing a means for selectively retrieving one or more particular retailer related records based upon a user entered product code and a maximum allowed deviation from said geographical availability.

15. A system for distributing information related to user purchasable products, said system comprising:

a database of records including fields related to identification, pricing, characterisation and geographical availability of a plurality of user purchasable products, said records also including fields related to a plurality of suppliers of the user purchasable products,

input means for receiving user input data related to at least a desired characterisation and geographical availability of a desired user purchasable product,

searching means for searching said database on the basis of said user input data and for determining a search result, said search result having records including said fields related to identification, pricing and supplier, and

an output display means for displaying said search result.

16. A system as recited in paragraph 15, wherein said fields relating to pricing are associated with a temporary storage element, the data within which is periodically checked according to temporal statement and if said check is true, then said data is loaded into said associated field related to pricing.

17. A system as recited in paragraph 15, wherein an authorised supplier can access one or more temporary storage elements.

18. A computerised method of distributing product information, said method comprising the steps of:

tendering a plurality of product types, for selection of one desired product type by a user,

tendering a plurality of product sub-types on the basis of the selected product type, for selection of one desired product type by the user,

tendering at least one or more relevant characterising product attributes, on the basis of the selected product type, for selection of one or more attribute preferences by the user,

obtaining geographical data related to an acceptable geographical purchasing area by the user, and

returning any of a plurality of pre-stored data records which correlate to all of said selections and said acceptable geographical purchasing area.

19. A method of dynamically constructing a searchable index of valid identifiers, said method comprising the steps of:

(i) prompting a user for an initial word;

(ii) building a set of possible valid identifiers based on said initial word and previously mapped relationships with respect to said initial word;

(iii) displaying said set for selection by the user,

(iv) adding the initial word to a list of unmatched words, prompting the user for a new initial word and repeating from step (ii), if a selection from said set has not been made by the user;

(v) providing a further mapped relationship for each of said list of unmatched words with a selected valid identifier, if a selection from said set is made by the user.

20. A method of facilitating Internet-assisted commerce as claimed in claim 14, wherein the user entered product code is taken from a searchable index of valid identifiers dynamically constructed with the steps of:

(i) prompting a user for an initial word;

(ii) building a set of possible valid identifiers based on said initial word and previously mapped relationships with respect to said initial word;

(iii) displaying said set for selection by the user,

(iv) adding the initial word to a list of unmatched words, prompting the user for a new initial word and repeating from step (ii), if a selection from said set has not been made by the user;

(v) providing a further mapped relationship for each of said list of unmatched words with a selected valid identifier, if a selection from said set is made by the user.

21. An indexing system comprising:

means for obtaining an initial word of interest;

a database for storing words and any related alternative words, each of said stored words being searchable on the basis of a mapped relationship with the initial word of interest; and

means for mapping and storing newly related words to said database where a search of the database cannot be determine a mapped relationship with the initial word of interest.

22. A product information distribution system substantially as described herein with reference to any one of the embodiments as that embodiment is illustrated in the drawings.

DATED this THIRTIETH day of NOVEMBER 1999
Jonathon Robert Burnett

Patent Attorneys for the Applicant
SPRUSON & FERGUSON

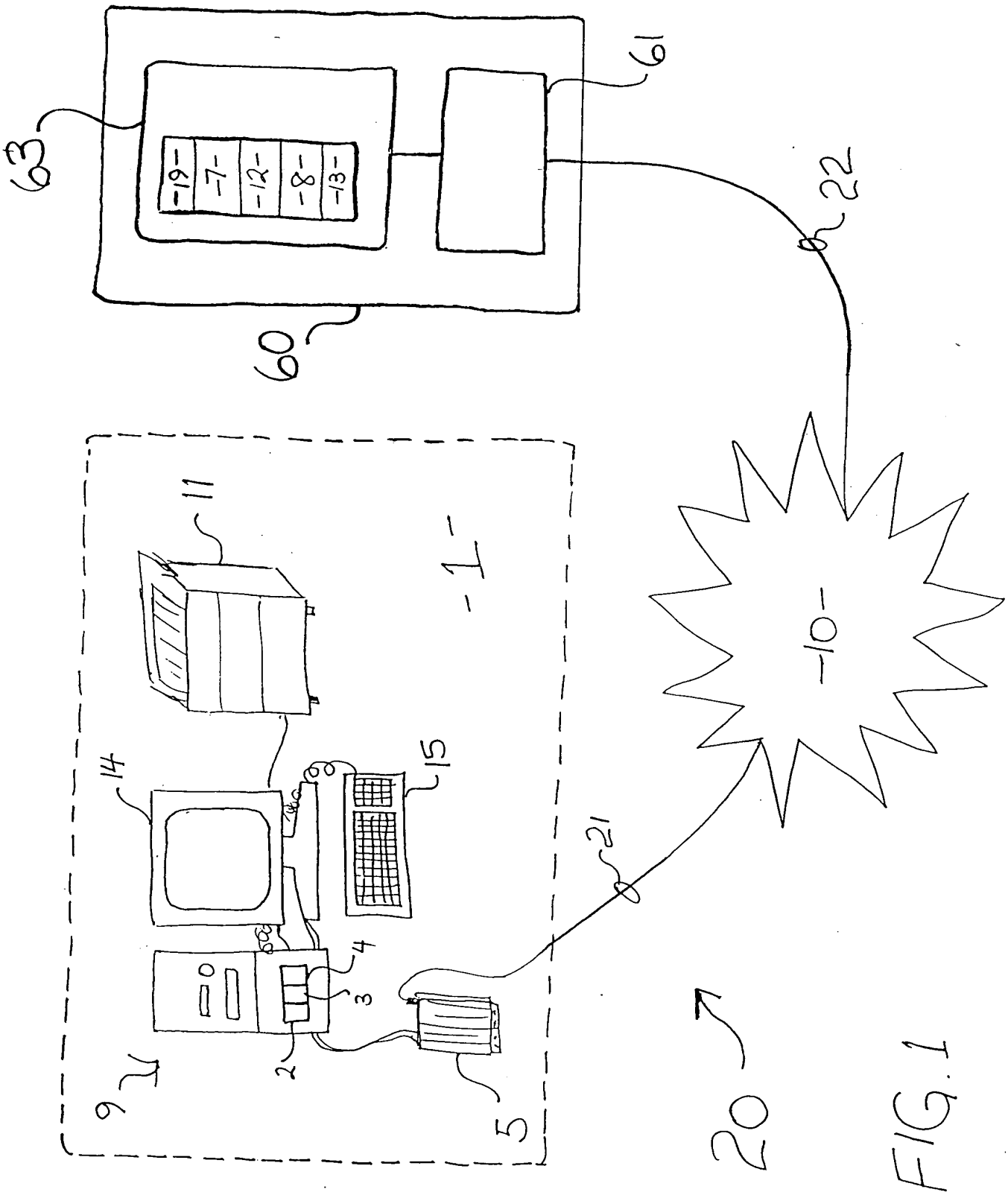


FIG. 1

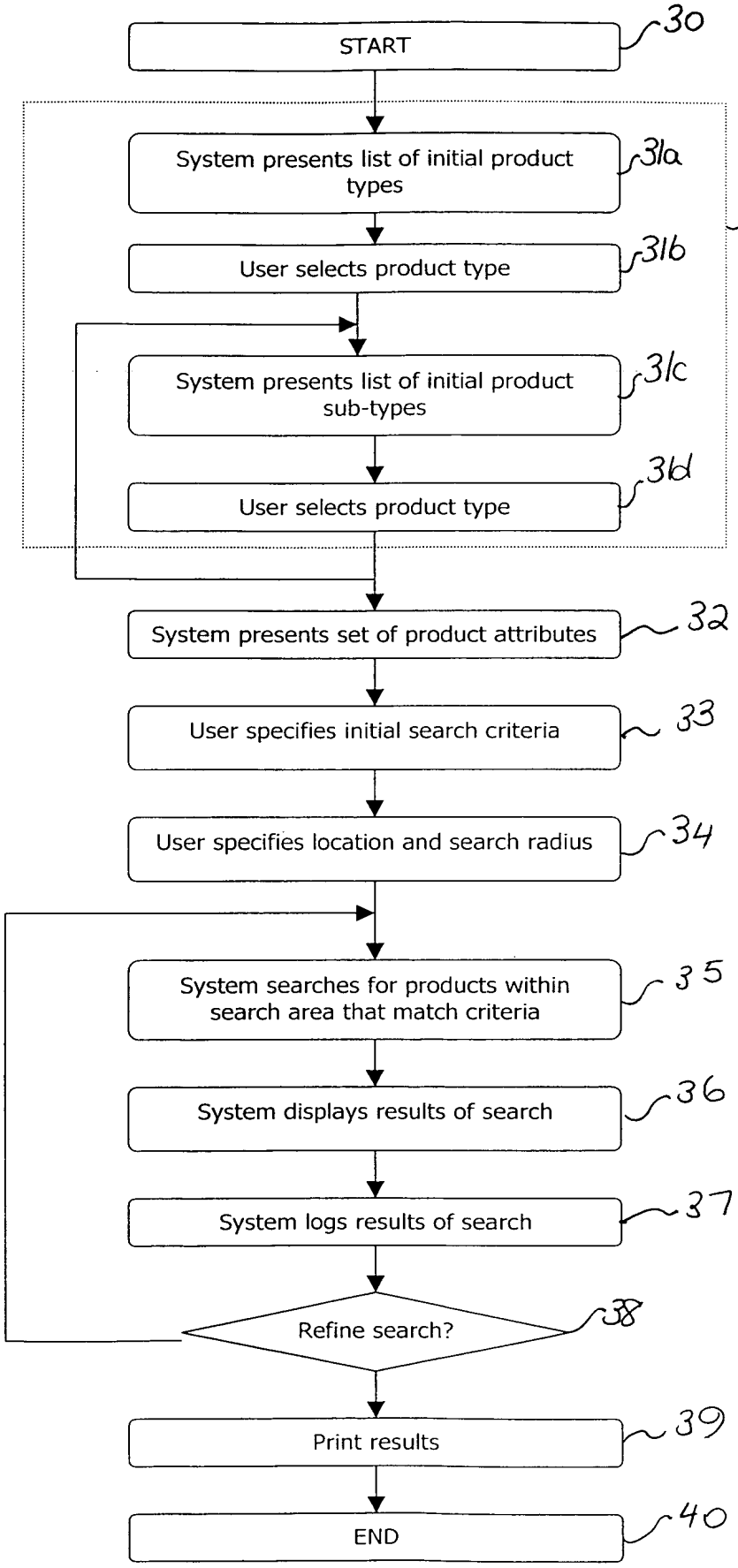

START
30
System presents list of initial product types
31a
31
User selects product type
31b
System presents list of initial product sub-types
31c
User selects product type
31d
System presents set of product attributes
32
User specifies initial search criteria
33
User specifies location and search radius
34
System searches for products within search area that match criteria
35
System displays results of search
36
System logs results of search
37
Refine search?
38
Print results
39
END
40

FIG. 2

	Data Type: **Supplier**
a	Supplier ID
b	Supplier name

70

	Data Type: **Product**
a	Product ID
b	Barcode number
c	Product name
d	Product Description
e	*& Supplier
f	*& Product type

71

	Data Type: **Product Type**
a	Product Type ID
b	Type name
c	Table name
d	*& Product type

72

	Data Type: **Product Definition**
a	*& Product Type ID
b	Field name
c	Caption
d	Control type
e	Control source

74

	Data Type: **Retailer**
a	Location ID
b	Type flag (Physical/on-line)
c	Latitude
d	Longitude
e	Store name
f	Street address
g	Suburb
h	State
I	Post code
j	Country
k	Telephone
l	Web Address
m	*& Retail Group ID

75

	Data Type: **Retail Group**
a	Retail Group ID
b	Group name

76

	Data Type: **Price**
a	*& Retail Group ID
b	*& Product ID
c	Start date
d	Finish date
e	Unit price
f	Normalised price
g	Normalised quantity
h	On special flag
I	Time stamp

77

	Data Type: **Stock**
a	*& Location ID
b	*& Product ID
c	In stock flag
d	Stock level
e	Date updated
f	Time stamp

78

	Data Type: **Liquor Products**
a	*& Product ID
b	Product name
c	Product description
d	Country
e	Packet type
f	Packet size
g	Packet count
h	Alcohol content
I	Beer type
j	Spirit type
k	Wine type

FIG 3

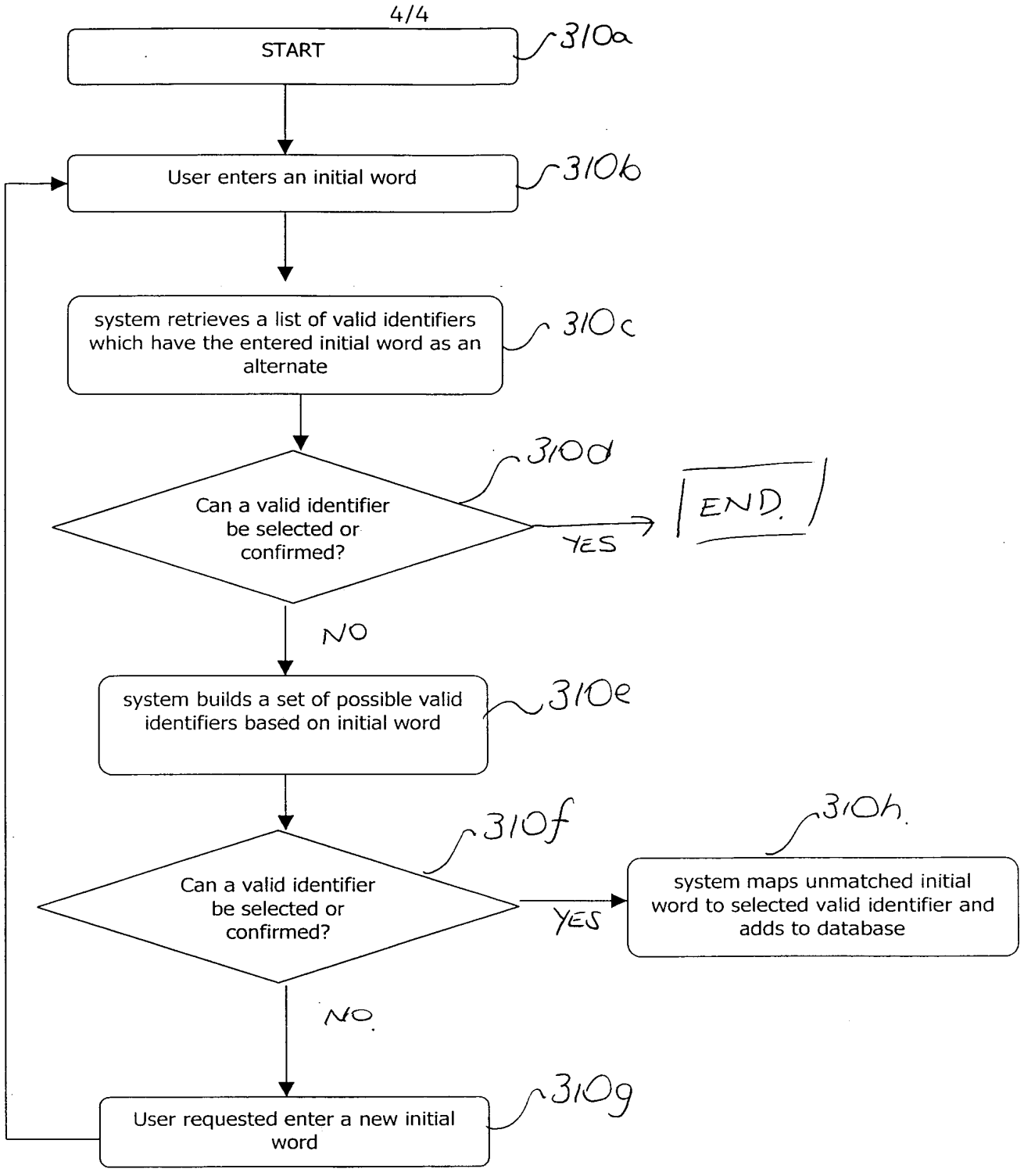

START
310a
User enters an initial word
310b
system retrieves a list of valid identifiers which have the entered initial word as an alternate
310c
Can a valid identifier be selected or confirmed?
310d
YES
END.
NO
system builds a set of possible valid identifiers based on initial word
310e
Can a valid identifier be selected or confirmed?
310f
YES
system maps unmatched initial word to selected valid identifier and adds to database
310h.
NO.
User requested enter a new initial word
310g

FIG 4